

WHAT IS CLAIMED IS:

1 1. A system for monitoring an industrial process, the system
2 comprising;
3 a process controller; an input module coupled to the process controller, the
4 input module being adapted to input a plurality of parameters from a process for
5 manufacture of a substance;
6 a computer aided process module coupled to the process controller, the
7 computer aided process module being adapted to compare at least two of the plurality
8 of parameters against a predetermined training set of parameters, and being adapted to
9 determine if the at least two of the plurality of parameters are within a predetermined
10 range of the training set of parameters; and
11 an output module coupled to the process controller, the output module
12 being adapted to output a result based upon the determining step.

1 2. The system of claim 1 wherein the substance is selected from a
2 petroleum product, a chemical product, a food product, a health product, a cleaning
3 product, a biological product, and other fluid or objects.

1 3. The system of claim 1 wherein the plurality of parameters are
2 selected from an intrinsic element or an extrinsic element of the process.

1 4. The system of claim 1 wherein the input module, the computer
2 aided process module, and the output module are provided in a computer software
3 program.

1 5. The system of claim 1 wherein the computer aided process includes
2 an algorithm selected from PCA, HCA, KNN CV KNN Prd, SIMCA CV, SIMCA Prd,
3 Canon Prd, SCREAM, and Fisher CV.

1 6. The system of claim 1 further comprising a normalizing module
2 coupled to the process controller, the normalizing module being adapted to normalize
3 each of the plurality of parameters before input into the computer aided process module.

1 7. The system of claim 1 wherein the training step of parameters are
2 preprocessed in at least two of the computer aided processes.

1 8. The system of claim 1 wherein the result is an affirmative response
2 or a negative response, where the response is displayed on a terminal.

1 9. The system of claim 1 wherein the computer aided process is
2 selected from a library comprising a plurality of processes.

1 10. The system of claim 9 wherein the plurality of processes includes
2 at least a comparing process, a contrasting process, and a functional process.

1 11. A system for monitoring an industrial process for the manufacture
2 of materials or objects, the system comprising:

3 an input module, the input module being adapted to input a plurality of
4 process parameters from a process for manufacture of a substance or object;

5 a library module coupled to the input module, the library module including
6 a plurality of computer aided processes, each of the computer aided processes being
7 capable of determining an output based upon a predetermined training set of the
8 plurality of process parameters;

9 an output module coupled to the library module, the output module being
10 adapted to output a result based upon the predetermined training set and the plurality
11 of process parameters;

12 wherein each of the computer aided processes compares at least two of the
13 plurality of process parameters against a portion of the training set of parameters and
14 determines if the at least two of the plurality of process parameters are within a
15 predetermined range of the portion of the training set of parameters.

1 12. The system of claim 11 wherein the substance is selected from a
2 petroleum product, a chemical product, a food product, a health product, a cleaning
3 product, a biological product, and other fluid or objects.

1 13. The system of claim 11 wherein the plurality of process parameters
2 are selected from an intrinsic element or an extrinsic element of the process.

1 14. The system of claim 11 wherein the input module, the library
2 module, and the output module are provided in a computer software program.

1 15. The system of claim 11 wherein the computer aided process
2 includes an algorithm selected from PCA, HCA, KNN CV KNN Prd, SIMCA CV,
3 SIMCA Prd, Canon Prd, SCREAM, and Fisher CV.

1 16. The system of claim 11 wherein the training set of parameters are
2 preprocessed.

1 17. The system of claim 11 wherein the process parameters comprise at
2 least olfactory information.

1 18. The system of claim 11 wherein the result is an affirmative
2 response or a negative response, where the response is displayed on a terminal.

1 19. The system of claim 11 wherein the library module comprises a
2 plurality of processes.

1 20. The system of claim 19 wherein the plurality of processes includes
2 at least a comparing process, a contrasting process, and a functional process.

1 21. A system for controlling a process, the system comprising:
2 a first field mounted device in communication with a process and
3 configured to produce a first input; and
4 process manager receiving the first input and configured to apply a first
5 model to the first input to identify a first predicted descriptor characteristic of a state of
6 the process, and configured to consult a first knowledge based system to provide an
7 output based upon the first predicted descriptor.

1 22. The system of claim 21 wherein the process manager is a server in
2 communication with the first field mounted device via a computer network.

1 23. The product of claim 21 wherein the process manager is a server in
2 communication with a user through a network of computers utilizing a browser software
3 program.

1 24. The product of claim 23 wherein the process manager is in
2 communication with the first field mounted device via the computer network.

1 25. The system of claim 21 further comprising a second field mounted
2 device receiving the output and adjusting an operational parameter of the process
3 according to the output.

1 26. The system of claim 21 further comprising an output module
2 including an interface between the process manager and an associated system including at
3 least one of a legacy system, an e-enterprise system, and a desktop application.

1 27. The system of claim 21 wherein the first knowledge based system
2 is an expert system.

1 28. The system of claim 21 wherein the model is constructed utilizing
2 one of a univariate statistical technique, a multivariate statistical technique, a time series
3 analysis, and a neural-based technique.

1 29. The system of claim 21 further comprising a library configured to
2 store one of a group of different algorithms utilized to construct the first model.

1 30. The system of claim 21 further comprising a library configured to
2 store one of a group of different algorithms utilized to construct the first model.

1 31. The system of claim 21 further comprising a second model, the
2 process manager configured to apply the second model to the data to identify a second
3 predicted descriptor characteristic of the process data, the process manager further
4 configured to produce the output based upon the first predicted descriptor and the second
5 predicted descriptor.

1 32. The system of claim 21 further comprising:
2 a second model; and
3 a second knowledge based system, the process manager applying the
4 second model to the data to identify a second predicted descriptor characteristic of the
5 process data, the second knowledge based system submitting one of the first predicted
6 descriptor and the second predicted descriptor to the first knowledge based system where
7 the first predicted descriptor is different from the second predicted descriptor.